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RECENTLY PUBLISHED RESEARCH OF INSTITUTE OF
PHYSICAL CHEMISTRY IMENI L. V. PISARZHEVSKIY,
ACADEMY OF SCIENCES USSR, MOSCOW

"Kinetics and Mechanism of Catalytic Conversion of
Carbon Monoxide," V. A. Royter, S. S. Gaukhman, N. P.
Pisarzhevskaya, T. M. Gvaliya, Inst Phys Chem imeni
L. V. Pisarzhevskiy, Acad Sci USSR, Moscow

"Zhur Priklad Khimii" Vol 18, 1945, pp 439-49

The dependence of yield of CO conversion to H and
CO_2 in the presence of H_2O was studied with the
following factors: space velocity, total and partial
pressures of the components, between 400° and 500°
over K-carbon catalyst and Fe oxide catalyst of
"nitrogen" type. The results are explained by a new
theory for the K-carbon catalyst in which the follow-
ing scheme of reactions is proposed: $2KOH + CO =
K_2CO_3 + H_2$; $K_2CO_3 + H_2O = 2KOH + CO_2$, with summary
result: $CO + H_2O = H_2 + CO_2$. In case of the Fe
catalysts there is evidence for considerable effect
of the following sequence: $2CO = CO_2 + C$; $C + 2H_2O =
CO_2 + 2H_2$.

"Purification of Air by Removal of Admixture of
Acetylene by Oxidation," V. A. Royter, M. Ya. Rubanik,
Yu. A. Snigurovskaya, E. A. Sadovnikova, Inst Phys
Chem imeni L. V. Pisarzhevskiy, Acad Sci USSR, Moscow

"Zhur Priklad Khimii" Vol 18, 1945, pp 450-6

It was shown that C_2H_2 can be removed from air by
oxidation in passage over the following catalysts:

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MnO_2, Mn ore promoted by Ag salts. The former is effective over a wide concentration range, the latter only for small concentrations. Various factors involved were studied. Generally, 160° is a sufficiently high temperature for complete removal of C_2H_2.

"The Active Smooth Iron Electrode" B. Kabanov, D. Leikis, Inst Phys Chem imeni L. V. Pisarzhevskiy, Acad Sci USSR, Moscow

"Zhur Fiz Khimii" Vol 20, 1946, pp 995-1003

The rapid depolarization that distorts measurements of smooth Fe electrodes is avoided if the volume of the solution around the electrode is very small (e.g., 0.02 cc for an electrode surface of 3.5 sq cm). If such an electrode, after being heat-treated in H_2 at 700° - 900°, is immediately immersed in 2 N NaOH and anodically polarized with the current kept constant, its potential shows two breaks; e.g., for cd 2.4 x 10^{-5} amp/sq cm these breaks are at +0.04 and +0.28 v (referred to H electrode) in 2 N NaOH. Extrapolation to zero current density yields the potentials -0.045 and +0.13 v. These presumably correspond to Fe | Fe $(OH)_2$ and to Fe | Fe$(OH)_2$;Fe$(OH)_3$ electrodes. The amount of electricity consumed by an electrode along a break (i.e., the electrode capacity) is, e. g., 0.15-0.20 coulomb per sq cm of the visible surface area. Fe electrodes which had contact with the air before being placed in 2 N NaOH show no breaks. Their potential is increased from 0 to 0.5 v by as little as 0.0001 coulomb/sq cm. Presumably, this passivity of air-oxidized Fe is of the same type as the passivity of Pt.

"The Kinetics of Exothermal Catalytic Reactions in a Current: II. Theory of Reaction on a Short Contact Layer," Ya. L. Margolis, O. M. Todes, Inst Phys Chem imeni L. V. Pisarzhevskiy, Acad Sci USSR, Moscow

"Acta Physicochimica URSS" Vol 21, 1946, pp 885-898

Theoretical mathematical equations are derived for a comparatively short reactor at not too small rates of flow. Two steady regimes, "quiet reactions" and "combustion regime," are established as in the previous case. For an unsteady extinction regime, the rate of cooling of the reactor and the activity of the catalyst can be connected by an almost linear relation; this permits the development of a simple method of evaluating the relative activities of catalysts for a given reaction.

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"Poisoning and Modifying Catalysts," S. Z. Roginskiy,
Inst Phys Chem imeni L. V. Pisarzhevskiy, Acad Sci
USSR, Moscow

A review of the earlier experimental work shows that
poisoning and promoting of catalysts by additions
are not as different as believed hitherto. The
mechanism usually postulated for poisoning and promot-
ing cannot account for the observations. A definite
impurity can either raise or lower the efficiency of
a catalyst according to its amount. The effect of a
definite amount of an impurity can be positive or
negative according to conditions. The increase of
efficiency is not always due to a reduction in the
activation. Catalysts can be modified by additions,
not only poisoned or promoted.

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